Chapter 8
USACE and Executive Order 12906

8-1. General

a. GD&S requirements at the Federal level revolve around the geospatial data itself. The unique character of geospatial data is recognized at the Federal level in Executive Order 12906, "Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure." All of the actions Commands must take related to geospatial data have their regulatory basis in EO 12906. In this EO, several requirements related to the handling of geospatial data are instituted at the Federal level with the intent of reducing data duplication and protecting the nation's large investment in this class of information.

b. The EO places five (5) requirements on Federal agencies regarding the acquisition and access of geospatial data. These are: (1) document new geospatial data using the FGDC Content Standard for Digital Geospatial Metadata. (Data are considered new if produced or collected since January 1995.); (2) document existing geospatial data to the extent practicable. (Data are considered existing if collected or produced prior to January 1995.); (3) make documentation accessible to the Clearinghouse; (4) utilize the Clearinghouse prior to the collection or production of new geospatial data; (5) establish procedures to make geospatial data available to the public.

c. In ER 1110-1-8156, HQUSACE has developed a method for meeting these requirements. This method will promote consistency in the way USACE geospatial data holdings are documented and publicized and provide a practical method of meeting the requirements.

8-2. Document New Geospatial Data

a. EO 12906 SEC 3(b) requires agencies to thoroughly document the origins and characteristics of geospatial they collect or produce. The term "metadata" has been adopted to refer to this documentation. The first standard adopted by the FGDC describes the information that must be included in metadata.

b. Data documentation requirements depend on the age of the data. The EO states, "... Beginning 9 months from the date of this order [April, 1994], each agency shall document all new geospatial data ...." Thus data are considered new if produced or collected since January 1995. FGDC compliant metadata are required for all new data. Fully compliant metadata includes all of the mandatory and mandatory if applicable elements. As discussed in paragraph 7-3 of this EM, several considerations guide Commands in documenting new geospatial data.

c. Often, several simultaneous data collection efforts are launched at the beginning of a project in order to assemble background data or to populate a carefully designed database. The database may be composed of multiple files each containing a specific data theme or covering a specified geographic area of the same theme. Metadata for reach of these individual files will contain a lot of repetitive information. It may be appropriate to document groups of files that form a well defined dataset with a single metadata file.

d. The full text of "Content Standards for Digital Geospatial Metadata," (FGDC, 1994) is available via the Internet at ftp://waisqvarsa.er.usgs.gov/wais/docs. This standard is referred to here as the "metadata standard." Metadata normally reside in a text file distinct from the data they describe and can be consulted and shared easily. By examining metadata, potential users determine if existing geospatial data held by USACE meet their needs and decide if they wish to obtain a copy of the data. The characteristics of geospatial data that must be documented are established by the metadata standard. Using commercial and public domain software tools, FGDC compliant metadata can be developed in a straight forward manner.

8-3. Document Existing Geospatial Data

a. Eo 12906 calls for each agency to document older geospatial data to the extent practicable. The volume and diversity of existing geospatial data held by USACE Commands represents, without some consolidation, an insurmountable number of metadata files to be generated and subsequently managed. More importantly, much of the information about the origins, characteristics, and previous processing of these older data may be lost or difficult to find.

b. HQUSACE has developed a practical approach to consolidating and documenting older data. This approach employs the concept of geospatial data "collections" and the use of "minimum required metadata."

c. A data collection is a logically consistent grouping of geospatial data that can be documented in a uniform manner. Collections may be established based on a consistent theme or on a consistent spatial domain. Each collection can then be documented by a single "collection metadata" file containing only the mandatory elements of the metadata standard (primarily Sections 1 and 7 of the Metadata Standard). These minimum collection metadata are only to be used for existing (pre-1995) geospatial data.

d. For some collections of older data it may be possible to include other elements of the metadata standard as well (e.g., all the items in a collection have the same spatial data organization or the same spatial reference parameters). Collection metadata of older data rely heavily on a strongly descriptive abstract and a complete set of theme and place keywords to convey to the reader the origin and characteristics of the items included in the collection.

e. An example of a geospatial data collection based on theme is hydrographic survey data. A single Command may hold thousands of individual pre-1995 digital files containing hydrographic survey data. For documentation purposes, it is advantageous to consider the entire holding of older hydrographic survey data, regardless of age, format, or project location as a "data collection" and to document this collection with a single "collection metadata" file. Other examples of theme based collections are geodetic/survey control, geophysical logs, aerial photographs, and water control data. An example of a collection metadata file for hydrographic survey data is given in Table 8-1.

f. HQUSACE has developed collection metadata templates for data themes commonly held by Commands. These templates are available electronically via the USACE Node. Commands may define additional geospatial data collections as needed when documenting large holdings of existing (pre-1995) geospatial data. The usefulness of collection metadata is enhanced if Commands maintain an inventory of the individual items (files) represented by the collection if this can be accomplished with reasonable resources.

g. Data collections based on spatial domain generally pertain to a specific project or installation. These "project collections" may contain a variety of engineering, environmental and operations data in various formats generated during planning, construction and operation of the project. A project collection metadata file is given in Table 8-2.

h. Not all existing data can be included in a collection. Geospatial data produced prior to January 1995, if not included in a collection, can be documented as resources become available or as necessary for purposes of data exchange.

8-4. Make Documentation Accessible to the National Geospatial Data Clearinghouse

a. The third requirement of EO 12906 is for Federal Agencies to make geospatial data documentation electronically accessible. The National Geospatial Data Clearinghouse (Clearinghouse) was established for this purpose. The Clearinghouse is a distributed, electronically connected network of geospatial data producers, managers, and users. The Clearinghouse allows its users to determine what geospatial data exist, find the data they need, evaluate the usefulness of the data for their applications, and obtain or order the data as economically as possible. The Clearinghouse is functioning as an electronic geospatial data locator and access service operating on the Internet and is a key element of EO 12906.

b. As the overall agency response to this requirement, HQUSACE has established and maintains a centralized Clearinghouse Node (USACE Node) (electronic address) for all USACE Commands. The USACE Node functions as the primary point of public access to documentation about the USACE geospatial data holdings. A separate electronic data page for each USACE activity is maintained by HQUSACE on this server. The Internet URL is http://corps_geo1.usace.army.mil. This electronic site is for Clearinghouse and related purposes.

c. Commands have two actions related to making their metadata documentation accessible to the Clearinghouse. Commands must complete and submit collection metadata for older data as discussed in paragraph 8-3 above. The templates available on the server may be used for this purpose. Commands must submit the completed metadata for new geospatial data as discussed in paragraph 8-2 above.

d. Commands will utilize the USACE node for the purpose of presenting their geospatial data holdings to the public and will update their data pages not less than once a year. Commands will prepare and submit to the USACE node, all metadata as discussed in paragraphs 7.g(1), 7.g(2), and 7.g(3) of ER 1110-1-8156 and in paragraphs 8-2 and 8-3 of this manual. Commands will use the USACE Clearinghouse node for submission of all collection and full metadata. The node may also be utilized as a location for electronic data delivery if desired. Frequently requested geospatial data may be placed on the node for unrestricted direct public access as appropriate. The INTERNET URL address for the Corps Clearinghouse node is http://corps_geo1.usace.army.mil.

e. Commands may establish supplemental Clearinghouse nodes in accordance with CEIM guidance on requirements for computer network security. Commands must assure a link is maintained from the USACE node to any supplemental nodes established by the Command. Use of a supplemental node does not remove the requirement to provide and maintain all metadata on the USACE node.

f. The USACE node as established and maintained by HQUSACE serves several purposes: (1) The node estab-

lishes a single electronic site with specified formats and protocols for USACE Commands to list their data holdings; (2) The node provides a starting point and search engine for Commands to use when checking the Clearinghouse for existing data; (3) By completing the collection metadata examples for existing data Commands may fulfill the requirement to document existing geospatial data; (4) The node provides a location for public distribution of geospatial data for use by Commands if desired; (5) The node provides a focal point for distribution of information regarding GD&S issues in USACE.

8-5. Search the Clearinghouse

The fourth requirement of EO 12906 is for each agency to check the Clearinghouse for usable, available geospatial data before expending funds to collect new data. HQUSACE has chosen to enforce this requirement at the Command level. As set forth in ER 1110-1-8156, each Command must certify it has searched the Clearinghouse for available data as part of the budget submission process. The USACE node provides a form-tool to assist in searching the Clearinghouse.

8-6. Establish Procedures to Make Geospatial Data Available to the Public

Commands should establish internal procedures for responding to legitimate requests from the public for copies of geospatial data in the Command's holdings.

Table 8-1
Collection Metadata Describing New Orleans District Hydrographic Survey Data Collection

Identification_Information:
Citation:
Citation_Information:
Originator: U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana

Publication_Date: 19951031
Title: Hydrographic Survey Data Collection

Description:
Abstract: The U.S. Army Corps of Engineers (USACE) maintains a collection of hydrographic surveys that have been obtained in accordance with USACE Engineer Manual (EM) 1110-2-1003, "Hydrographic Surveying." USACE in-house crews and contractors collect this data using the traditional hydrographic surveying echo sounding equipment, as well as, airborne laser platforms. Hydrographic surveys are performed of navigation lock approach channels, in river and harbor navigation projects, and within the major inland waterway tributaries, such as the Mississippi River. Surveys may include revetment locations, project, river structures, and comprehensive river surveys. Some surveys are point-on-range surveys along range lines established at regular intervals in rivers and channels. The hydrographic survey collection is composed of digital data files that contain 3-dimensional coordinates defining river and harbor bottoms. These files contain real world coordinates and can be related to absolute positions on the earth. Sometimes the hydrographic surveys are merged with overbank topographic surveys to create a full model of the channel cross sections. Recently, hydrographic surveys have been conducted with sweep and multi-beam sonar survey equipment, rather than via conventional data collection. This technology will become increasingly common on future surveys. The New Orleans District began collecting hydrographic survey data in 1880 and began maintaining the data in digital form in 1980. The digital holdings represent over 1500 hydrographic survey jobs. The New Orleans District hydrographic survey data is collected along the major tributaries, waterways, coastal harbors, and engineering projects within the district such as the Mississippi River, Atchafaylaya River, the Gulf Intracoastal Waterway, and major streams, tributaries, and passes to the Gulf of Mexico and coastal Louisiana.

Purpose: Hydrographic surveys are conducted in support of planning, engineering, and design, construction, operation, maintenance, and regulation of civil works navigation and flood control projects. Specific example uses of the survey data include performing channel and levee slope stability analyses and construction of USACE structures, such as locks and dams, levees, and flood walls. Hydrographic surveys are also taken to monitor channel shoaling and scour to maintain channels at navigable project depths.

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1880
Ending_Date: 1995
Currentness_Reference: ground condition
Status:
Progress: In work
Maintenance_and_Update_Frequency: Continually
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate:-94.25
East_Bounding_Coordinate:-88.67
North_Bounding_Coordinate:33.76
South_Bounding_Coordinate:28.28
Keywords:
Theme:
Theme_Keyword_Thesaurus: none
Theme_Keyword: hydrographic
Theme_Keyword_Thesaurus: none
Theme_Keyword: survey
Theme_Keyword_Thesaurus: none
Theme_Keyword: bathymetry
Place_Keyword_Thesaurus: Geographic Names Information System
Place_Keyword: Arkansas
Place_Keyword: Mississippi
Place_Keyword: Louisiana
Access_Constraints: None
Use_Constraints: These data were compiled for government use and represents the results of data collection/processing for a specific U.S. Army Corps of Engineers (USACE) activity. The USACE makes no representation as to the suitability or accuracy of these data for any other purpose and disclaims any liability for errors that the data may contain. As such, it is only valid for it is intended use, content, time, and accuracy specifications. While there are no explicit constraints on the use of the data, please exercise appropriate and professional judgment in the use and interpretation of these data.

(Continued)

Table 8-1 (Concluded)

Metadata_Reference_Information:
Metadata_Date: 19951031
Metadata_Contact: Chief, Surveys Section, Engineering Division
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U. S. Army Corps of Engineers, New Orleans District,

Contact_Address:
Address_Type: mailing address
Address:P.O. Box 60267
City: New Orleans
State_or_Province:LA>
Postal_Code: 70160-0267
Contact_Voice_Telephone: 504-865-1121

Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 19940608

Table 8-2
Collection Metadata Describing the Kissimmee River Restoration Project Data Collection at the Jacksonville District

Identification_Information:
Citation:
Citation_Information:
Originator:
US Army Corps of Engineers
Jacksonville District
Jacksonville, Florida

Publication_Date: 19950901
Title: Kissimmee River Restoration Surveys

Description:
Abstract:
Digital orthophotography covering the Kissimmee River flood plain between Lake Kissimmee and Lake Okeechobee, was collected in support of the Kissimmee River Restoration (KRR). This collection consists of the orthoimagery, contours, spot elevations, cross sections, bathymetry and digital terrain models (DTMs). Some data is in ARC/INFO coverages and Grids, some in Intergraph design files, some in both. The flood plain of the Kissimmee is considered as divided into four pools along its length which correspond to structures along Canal 38. Each pool is further divided into blocks which serve to keep the file size of the data manageable. The grids, the contours, spot elevations, and other vector coverages are tiled to correspond to these blocks. The orthoimages are tiled to provide a standard engineering drawing at a scale of 1" = 100', and there are typically 7-10 of them per block. The surveys and photogrammetry were performed by private architectural and engineering (A&E) contractors for the Corps of Engineers. Each pool was awarded to a different contractor. As a result, there are inconsistencies in the data provided when one pool is compared to another.
Contours, spot elevations and a DTM in ARC/INFO and Intergraph format were provided for all pools. Additional coverages such as cross sections and design files of other features, such as utilities and building footprints were provided at the discretion of the individual contractors. The orthoimages are 8-bitgreyscale TIFF; pixel size is 1x1 foot. Individual images are 3000 x 2500 pixels, and 375 of these 7.5 Mb files are required to cover the flood plain: 146 for Pool A, ?? for Pool B, 114 for Pool C and ?? for Pool D.
Index contours occur at five foot intervals with supplemental contours at one foot intervals.
Photogrammetrically derived spot elevations are at approximate 60 foot grid spacing where the ground was not obscured.

Digital terrain models are in the form of ARC/INFO floating point Grids, Intergraph DTMs and TTNs with a 60 foot cell size.

Purpose:
The data were collected to support and monitor the progress of the KRR, an environmental restoration project designed to return hydrology in the flood plain to a state more closely resembling that which preceded the construction of C-38. The data are suitable for applications that require detailed elevation data and high resolution aerial orthoimagery of this area. Some examples of these are inundated area mapping, land use determination, and existence of structures, roads and drainage features on lands subject to inundation.

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19950401
Currentness_Reference: Publication date of sources

Status:
Progress: In work
Maintenance_and_Update_Frequency: None

Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -81.2590
East_Bounding_Coordinate: -80.8370
North_Bounding_Coordinate: 27.8250
South_Bounding_Coordinate: 27.1090

Keywords:
Theme:

(Continued)

Table 8-2 (Concluded)

Theme_Keyword_Thesaurus: none
Theme_Keyword: Aerial photography
Theme_Keyword: Topography
Theme_Keyword: Orthoimagery
Theme_Keyword: DTM
Place_Keyword_Thesaurus: Geographic Names Information System
Place_Keyword: Florida
Place_Keyword: Kissimmee
Place_Keyword: C-38
Place_Keyword: Osceola County
Place_Keyword: Polk County
Place_Keyword: Okeechobee County
Place_Keyword: Highlands County
Access_Constraints: none
Use_Constraints:
These data were collected and processed for government use in a specific US Army Corps of Engineers (USACE) activity. The Jacksonville District makes no representation as to the suitability or accuracy of these data for any other purpose and disclaims any liability for errors that the data may contain. As such, it is only valid for its intended use within its content, time and accuracy specifications. While no explicit constraints are placed on the use of this data, please exercise appropriate and professional judgement in it's use and interpretation.
Metadata_Reference_Information:
Metadata_Date: 19950824
Metadata_Contact:
Chief, Survey Section, Engineering Division

Contact_Information:
Contact_Organization_Primary:
Contact_Organization:
US Army Corps of Engineers
Jacksonville District
Survey Section, CESAJ-EN-DT

Contact_Address:
Address_Type: mailing address
Address: PO Box 4970
City: Jacksonville
State_or_Province: FL
Postal_Code: 32232-0019
Contact_Voice_Telephone: 904-232-1606
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 19940608
